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ABSTRACT

The relationship of self-reported study behaviors, affect toward the course, test anxiety, and past achievement to final examination performance were investigated. Subjects were students in Education who enrolled in an undergraduate measurement course. Six study behavior factors in combination with the affect, anxiety, and past achievement variables were used to predict scores on the course final. The six study factors examined were: (1) participation in an organized study group; (2) using the teacher as a resource person; (3) preparation for class; (4) preparation for exams; (5) reviewing material after each class; and (6) using formative evaluation techniques. Multiple regression analysis yielded a significant Multiple R. Past achievement explained the largest proportion of the variance in final examination scores, but study behavior factors II (using the teacher as a resource person) and VI (using formative evaluation procedures) yielded significant partial correlations. Statistical data are included. (Author/MSE)

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Study Behavior and Academic Achievement

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This paper was presented at the Annual Meeting of the Association for the Study of Higher Education held at the Washington Hilton in Washington, D.C. April 18-19, 1979. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Prediction of academic success has been a traditional area of interest in the college and university environment (Berdie, 1944; Lavin, 1955; and Lunnebourg, 1975); and several types of cognitive and non-cognitive variables have been studied as predictors of academic achievement. Intelligence, special aptitudes, and past achievement are the cognitive variables which have a demonstrated relationship to present achievement (Schroeder and Sledge, 1966; Baird, 1968; Lunnebourge, 1974; and DesLauries, 1977). Non-cognitive variables such as affect toward a course and anxiety about performance in a course represent a second type of variable which has been studied as a predictor of achievement (Lenning, 1974; Bryan, 1977; and Tollefson, 1978). However, the results of studies in this area have been inconsistent and contradictory.

Study behavior represents a third type of variable to be studied. Interest in study behavior as a predictor of academic achievement has re-emerged with increased interest in maximumizing academic success. The characteristics of study time (type of study, duration of study, type and degree of reinforcement for study, etc.) have always claimed the attention of Educational and Behavioral Psychologists; however, research has tended to be experimental rather than field based. The present study represents a field based approach to studying the relationship between study behavior related affective and cognitive variables and achievement. All data were collected as part of the regular class activities and every attempt was made to integrate data collection into the classroom routine.

Methodology

The present study investigated the relationship of self-reported study behaviors, attitude toward the course, anxiety at the time of the final examination, and past achievement to preformance on an undergraduate final examination.

Subjects

Subjects in the study were undergraduate students majoring in Education and enrolled in the required measurement class. The class was divided into four sections and there was no systematic differences among students enrolled in the sections. One hundred sixty students were enrolled in the four sections of the course. One hundred fifty students agreed to contribute data and complete data were available from 129 students (81% of the total group).

Instruction Model

The course content was organized into seven units, and instruction in the course was managed by objectives. Each unit had a set of behaviorally stated objectives, a set of activities, and an optional formative multiple choice examination. Items for the formative examinations were selected from the same item pool as the items for the course mid-term and final examinations. A scoring key for each formative examination was available to students. Completion of the formative examination was optional and no record was maintained by instructors of whether or not students utilized the formative examinations for feedback about their progress in the course. All sections followed the same course syllabus and were administered a common mid-term and final examination.

Instruments

Each student subject completed four measures the last week of the academic semester. The measures completed were:

1) The Study Behavior Questionnaire: This questionnaire included 26 items covering such topics as reading the text, developing written aids, using formative evaluation procedures, and participating in study groups. Students used a 4 point scale in responding to the items (1 = almost always).

2) An Attitude and Relevance Scale (Deaton, Poggio, and Glasnapp, 1977). This scale consisted of 27 items to which the respondent indicated his/her degree of agreement on a 4 point scale. Statements focused upon attitudes toward the course (This course was interesting) and perceived relevance of the course (The material covered was vitally important to my professional interests). This scale had an internal consistency reliability of .87.

3) The State-Trait Anxiety Scale (Spielberger, Gorsuch, and Lushene, 1970). This scale includes 20 items. Responses are recorded on a 4 point scale.

4) Cumulative Grade Point Average. Each student reported his/her cumulative GPA. These data were summarized into four categories (1 = 2.0-2.49 to 4 = 3.50-4.00).

These measures constituted the independent variables used in the study. Score on the final examination was the dependent variable.

5) Course Final: The Course final was composed of 76 multiple choice items. The final was developed from course objectives thus insuring content validity. Kuder-Richardson reliability was .92.

Data Analysis and Results

Analysis of the data progressed in two steps: Factor analysis of the study behavior questionnaire and regression analysis to identify the dependent variables which predicted success on the course final examination.

Factor analysis of the study behavior data was accomplished by the SPSS Principal Factors Factor Analysis Program. A minimum eigenvalue of 1.0 was used in extracting factors and the varimax rotational method was used to identify the factors. Six factors were identified. These factors explained 66% of the score variance. The factors were labeled as follows: Factor I Participated in an Organized Study Group; Factor II Used Teacher as a Resource Person; Factor III Prepared for Class Prior to the Class; Factor IV Studied Material Prior to Examinations; Factor V Reviewed Class Materials after Each Class; and Factor IV Used Formative Evaluation Procedures. Table 1 gives the results of the factor analysis.

Insert Table 1

Multiple regression analysis was used to test for a linear relationship between score on the course final examination and the set of 9 independent variables (Study Behavior Factors, Attitude twoard the Course, State Anxiety, and Cumulative GPA). A significant Multiple R of .559 was obtained. Thirty-one percent (31%) of the obtained variance was explained by regression ($F = 5.55$, $df = 5, 110$, $p < .01$). Five variables were entered into the regression equation before the inclusion of additional variables failed to significantly increment the Multiple R.

Partial correlation coefficients from the step-wise regression analysis were used to identify the particular independent variables which had a significant linear relationship to final examination score once the effect of the other independent variables was removed. Three variables had significant partial correlations. They were cumulative grade point average and Study Behavior Factors II and VI. These results indicated that past achievement explained the largest part of the variance with utilization of formative evaluation procedures and use of the teacher as a resource person explaining the remaining predictable variance. Table 2 gives the results of the multiple regression analysis.

Insert Table 2

Discussion

Two types of study behaviors were shown to explain a significant proportion of the variance in course final examination scores. Utilization of formative evaluation procedures as study aides (Factor VI) was positively related to success on the final as was using the teacher as a resource person. Bloom, Hasting, and Madus (1971) and Scriven (1967) have argued that formative evaluation contributes positively to student achievement. This study offers support for this view.

Talking with the instructor outside of the class about course related matters was also related to success on the final examination. Students indicating that they talked with their instructors outside of class about course concepts as a group earned significantly higher final examination scores than students who did not. Thus the use of the teacher as a resource person was associated in this study with higher end-of-course achievement.

Participation in a study group (Factor I) was negatively related to success on the examination. Group study sessions would seem to offer the student the opportunity to refine his/her understanding of the material, but in this investigation, group study did not facilitate attainment of high scores on the course final. Thus, it appears that group study, when it means a few students meeting at their convenience to study course material, is not characteristic of high performance on course final in a measurement course.

While study behavior explained differences in final examination scores, past achievement as reflected in the student's reported cumulative grade point average was the single best predictor of success on the final examination. Furthermore, students with grade point averages of B or better could not be differentiated by their study behavior from students with lower grade point averages. State anxiety at the time of the examination and perceived relevance of the course content did not explain significant portions of the variance in scores.

In summary, this study suggests that study behavior was significantly related to course achievement. The proportion of the explained variance is small, but is still probably of practical importance. Feedback to students about their progress in learning course material is known to be related to achievement. Formative evaluations provide feedback to students and in this study were significantly related to higher final examination performance.

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Table 1

Results of the Factor Analysis of the Study Behavior Data

Factor I: Participated in an Organized Study Group	
Item	Factor Loading
Participated in a study group wnere concepts were discussed	.82
Participated in a study group where group members quizzed each other	.84
The group consisted of 1 - 5 members	.67

Factor II: Used the Teacher as a Resource Person	
Item	Factor Loading
Talked with the instructor once	.72
Talked with the instructor about concepts in 2 units	.86
Talked with instructor about concepts in most units	.81

Factor III: Prepared for Class Prior to Class	
Item	Factor Loading
Read assigned reading prior to the discussion of the unit	-.70
Outlined reading assignments	.44
Wrote chapter summaries	.82
Made lists of terms and definitions	.61

Factor IV: Studied Prior to the Final

Item	Factor Loading
Studied when it came to study for the final	.68
Studied with materials with friends in the class in preparation for final	.70

Factor V: Reviewed Class Material After Each Class

Item	Factor Loading
Reread text to clarify concepts	.83
Reviewed class notes	.70
Underlined important points in the text	.58
Rewrote lecture notes	.75

Factor VI: Used Formative Evaluation Procedures

Item	Factor Loading
Read text while the unit was discussed	.47
Studied unit objectives	.51
Completed Formative Exams	.78

Table 2

Results of the Multiple Regression Analysis

Variable	Beta	F
GPA	.42	26.5*
Factor 6	-.34	6.79*
Factor 2	-.29	5.58*
Factor 1	.25	3.84
Factor 3	.27	3.56

$p < .05$